

ABSTRACT OF THE DISCLOSURE

A fuel injection valve for an automotive internal combustion engine comprises a needle valve and an opposite member which are in slidable contact with each other in presence of fuel. A hard carbon thin film is coated on at least one of the sliding sections of the base materials of the needle valve and the opposite member. The hard carbon thin film has a surface hardness ranging from 1500 to 4500 kg/mm² in Knoop hardness, a film thickness ranging from 0.3 to 2.0 μm, and a surface roughness (Ry) (μm) which satisfies a relationship represented by the following formula (A):

$$R_y < (0.75 - H_k/8000) \times h + 0.0875 \dots (A)$$

where h is the thickness (μm) of the hard carbon thin film; H_k is the surface hardness in Knoop hardness (kg/mm²) of the hard carbon thin film.